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43. (Amended) The further PH5W4-derived maize plants, or parts thereof, produced by the method of claim 42.

48. (Amended) The single gene conversion maize plant of claim 47, wherein the gene is a dominant allele.

49. (Amended) The single gene conversion maize plant of claim 47, wherein the gene is a recessive allele.

REMARKS

In the Office Action dated March 25, 2002 the Examiner states that "Claims 1, 6, 21, 25, 37, and 40 are objected to for their inclusion of blanks '____'. It is assumed that the blanks will be replaced by the ATCC deposit accession number." Claims 1, 6, 21, 25, 37, and 40 have been so amended by deleting the blank spaces and inserting the ATCC deposit number. The specification has also been amended to include the terms of the deposit for PH5W4. A copy of the ATCC deposit receipt is included in this response. These actions obviate the objection and place claims 1, 6, 21, 25, 37, and 40 in condition for allowance.

The Examiner states that, "Claims 3 and 22 are indefinite in their recitation of 'wherein the plant is male sterile' Replacement of the phrase with --further comprising a genetic factor conferring male sterility-- would obviate this rejection." Claims 3 and 22 have been so amended and thus claims 3 and 22 are now in condition for allowance.

The Examiner states that, "Claims 5 and 24 are indefinite in their recitation of the 'the...protoplasts' which lacks antecedent basis in the claims from which they depend. Deletion of 'the' before 'cells' in line 1, and insertion of --of the tissue culture-- after 'protoplasts' in line 1, would obviate this rejection." Claims 5 and 24 have been amended as suggested and are now in condition for allowance.

The Examiner states that, "Claims 14, 33, 41, 45 and 46 are indefinite in their recitation of 'good', 'high', 'above average', 'below average', and 'adapted' which are unduly narrative and so fail to clearly characterize the degree of expression of the claimed trait or the claimed maize plant exhibiting the trait." Claims 14 and 41 have been amended and no longer include such terms as "good", "high", "above average", "below average", and "adapted". Claims 33, 45, and 46 have been cancelled.

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The Examiner states that, "Claims 16 and 35 are indefinite in their recitation of '[t]he maize plant breeding program' since the claims from which they depend are drawn to methods rather than breeding programs. Replacement of the phrase with '[t]he method' would obviate this rejection." Claims 16 and 35 has been so amended and therefore are in condition for allowance.

The Examiner states that, "Claims 19-20 and 48-49 are indefinite in their recitation of '[t]he single gene conversion(s) of claim' since the preceding claims are drawn to maize plants rather than single gene conversions. Replacement of 'conversion(s)' with --conversion--, and insertion of --maize plant -- after 'conversion', would obviate this rejection." Claims 19-20 and 48-49 have been amended as suggested by the Examiner and therefore the claims are in condition for allowance.

The Examiner states that, "Claims 14, 33, 43, and 45-46 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Krier (U.S. 5,731,503)." The Examiner goes on to state, "The claims are drawn to maize plants exhibiting two traits and which are derived from the exemplified maize inbred following an unspecified number of crosses for an unspecified number of generations with other plants of unspecified genetic complements, wherein at least one parent was the exemplified maize plant." Claims 33, 45, and 46 have been cancelled. Claims 14, 42, and 43 have been amended, and now each claim clearly has a limit on the number of crosses away from PH5W4. Claim 14 has been amended and now reads, "An inbred maize plant, or parts thereof, wherein said inbred maize plant was developed by a cross of the maize plant of claim 2 with a second maize plant, growing a progeny seed obtained from said cross, and repeating the steps of selfing and growing each subsequent generation to obtain said inbred maize plant." Claim 14 is limited to an inbred maize plant one cross away from PH5W4. Support for this amendment can be found in the specification, for example, on page 3, line 31 through page 4, line 5. Claim 42 has been amended to read, "The method of claim 40, further comprising: (c) crossing said PH5W4-derived maize plant with itself to yield additional PH5W4-derived progeny maize seed; (d) growing said progeny maize seed of step (c) under plant growth conditions, to yield additional PH5W4-derived maize plants; (e) repeating the crossing and growing steps of (c) and (d) to generate further PH5W4-derived maize plants." Claim 43 now through dependency is limited to one cross away from PH5W4. For clarification, claim 43 has been amended to read, "The further PH5W4-derived maize plants, or parts thereof, produced by the method of claim 42."

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The Examiner goes on to state that "...*In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985), which teaches that a product-by-process claim may be properly rejectable over prior art teaching the same product by a different process, if the process of making the product fails to distinguish the two products." The Applicant points out that while the processes of breeding, cross-pollinating, growing, and self-pollinating are not unique processes, the use of the unique invention PH5W4 in the processes makes the processes and the products resulting from those processes unique. The requirement of claims 14 and 43 is that PH5W4 is used, thus making the processes and their resulting products unique. In light of the amendments and remarks the Applicant requests that the Examiner reconsider his rejection and allow claims 14 and 43.

Examiner rejects claims 1-49 under 35 U.S.C. 103(a) as being unpatentable over Krier (U.S. 5,731,503).

In the application, the Examiner has noted some similarities in the morphologies inbred maize line PH5W4 and the Krier inbred maize line NP 948: yellow endosperm, dark green leaves, purple glume, red cob, and resistance to *Fusarium*- and *Diplodia*-induced rots. However, in addition to these similarities, there are also notable differences. The most notable differences are the area of adaptability, relative maturity ratings, and parentage suitability. On page 17, lines 3-8, of the application it states, "Inbred maize line PH5W4 is a yellow, dent maize inbred that is suited as a female for producing first generation F1 maize hybrids. Inbred maize line PH5W4 is best adapted to the Central Corn Belt, Southcentral and Southeast regions of the United States and can be used to produce hybrids from approximately 116 relative maturity based on the Comparative Relative Maturity Rating System for harvest moisture of grain." In the Krier patent it states in column 2, lines 22-25, "Inbred corn line NP 948 is a yellow dent inbred line with superior characteristics and is best suited as a male in crosses for the production of first generation F1 corn hybrids. And in Tables 4 and 5 of the Krier patent it states that hybrids using NP 948 have relative maturity ratings between 88-95. Also of note is the yield differences between the hybrids made from the inbreds. The application for PH5W4 reports hybrid yields of 183-186 bushels per acre (Tables 3A-3C and Table 4, pages 44-47. The Krier patent for NP 948 reports hybrid yield of 140 bushels per acre. Though these tests were not side-by-side comparisons the data would tend to support difference in yield potentials. The following table notes some other differences between inbred maize line PH5W4 and the maize line NP 948. This

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information can be found in Table 1 on pages 18-20 and in Table 1 of the Krier patent, 5,731,503.

PH5W4	NP 948
1,491 heat units from emergence to 50% plants in silk	1,336 heat units from emergence to 50% plants in silk
203 inches = plant height	188 inches = plant height
Silk color is pink	Silk color is green

The Applicant respectfully disagrees with the Examiner. Applicant submits that though PH5W4 and NP 948 exhibit some similar physiological and morphological traits, PH5W4 is clearly differentiated from NP 948. One would not be able to obtain PH5W4 through modification of the maize inbred taught by Krier because PH5W4 comprises a unique and nonobvious combination of genetics. Further, plants derived from PH5W4 are also clearly differentiated, and are themselves a unique and nonobvious combination of genetics derived from PH5W4. Thus, they deserve to be considered new and nonobvious compositions in their own right.

In light of the above, Applicant respectfully requests the Examiner reconsider and withdraw the rejection to claims 1-49 under 35 U.S.C. 103(a).

Cancellation of claims 33, 45, and 46 and amendment of claims 1, 3, 5, 6, 14, 16, 19, 20, 21, 22, 24, 25, 35, 37, 40, 41, 42, 43, 48, and 49 does not in any way change the claim scope which the Applicant believes is allowable but is meant to hasten the issuance of the patent.

CONCLUSION

Attached hereto is a marked-up version of the changes made to the specification and claims by current amendment. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

Applicant submits that in light of the foregoing amendments and the remarks, the claims 1-32, 34-44, and 47-49 are in condition for allowance. Reconsideration and early notice of allowability is respectfully requested. If it is felt that it would aid in prosecution, the Examiner is invited to contact the undersigned at the number indicated to discuss any outstanding issues.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE**In the specification**

On page 49, lines 2-21 have been deleted and the clean paragraph as written was inserted.

In the claims

Claims 33, 45, and 46 were deleted.

Claims 1, 3, 5, 6, 14, 16, 19, 20, 21, 22, 24, 25, 35, 37, 40, 41, 42, 43, 48, and 49 were amended as follows:

1. (Amended) Seed of maize inbred line designated PH5W4, representative seed of said line having been deposited under ATCC Accession No. [] PTA-4434.

3. (Amended) The maize plant of claim 2 [, wherein said plant is male sterile] further comprising a genetic factor conferring male sterility.

5. (Amended) A tissue culture according to claim 4, [the] cells or protoplasts of the tissue culture being from a tissue selected from the group consisting of leaves, pollen, embryos, roots, root tips, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.

6. (Amended) A maize plant regenerated from the tissue culture of claim 4, capable of expressing all the morphological and physiological characteristics of inbred line PH5W4, representative seed of which have been deposited under ATCC Accession No. [] PTA-4434.

14. (Amended) [A] An inbred maize plant, or parts thereof, wherein [at least one ancestor of said maize plant is] said inbred maize plant was developed by a cross of the maize plant of claim 2[, said maize plant expressing a combination of at least two PH5W4 traits selected from the group consisting of: a relative maturity of approximately 116 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, high yield, below average scattergrain ears, above average resistance to Ear Mold, good grain texture, above average grain quality, above average early stand count, above average early growth, above average stalk lodging resistance, adapted to the Central Corn Belt, Southcentral and Southeast regions of the United States] with a

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second maize plant, growing a progeny seed obtained from said cross, and repeating the steps of selfing and growing each subsequent generation to obtain said inbred maize plant.

16. (Amended) The [maize plant breeding program] method of claim 15 wherein plant breeding techniques are selected from the group consisting of: recurrent selection, backcrossing, pedigree breeding, restriction fragment length polymorphism enhanced selection, genetic marker enhanced selection, and transformation.

19. (Amended) The single gene [conversion(s)] conversion maize plant of claim 18, wherein the gene is a dominant allele.

20. (Amended) The single gene [conversion(s)] conversion maize plant of claim 18, wherein the gene is a recessive allele.

21. (Amended) A maize plant, or parts thereof, having all the physiological and morphological characteristics of inbred line PH5W4, representative seed of said line having been deposited under ATCC accession No. [_____] PTA-4434.

22. (Amended) The maize plant of claim 21 [, wherein said plant is male sterile] further comprising a genetic factor conferring male sterility.

24. (Amended) A tissue culture according to claim 23, [the] cells or protoplasts of the tissue culture being from a tissue selected from the group consisting of leaves, pollen, embryos, roots, root tips, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.

25. (Amended) A maize plant regenerated from the tissue culture of claim 23, capable of expressing all the morphological and physiological characteristics of inbred line PH5W4, representative seed of which have been deposited under ATCC Accession No. [_____] PTA-4434.

35. (Amended) The [maize plant breeding program] method of claim 34 wherein plant breeding techniques are selected from the group consisting of: recurrent selection,

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backcrossing, pedigree breeding, restriction fragment length polymorphism enhanced selection, genetic marker enhanced selection, and transformation.

37. (Amended) A process for producing inbred PH5W4, representative seed of which have been deposited under ATCC Accession No. [_____] PTA-4434, comprising:

- (a) planting a collection of seed comprising seed of a hybrid, one of whose parents is inbred PH5W4 said collection also comprising seed of said inbred;
- (b) growing plants from said collection of seed;
- (c) identifying said inbred PH5W4 plants;
- (d) selecting said inbred PH5W4 plant; and
- (e) controlling pollination in a manner which preserves the homozygosity of said inbred PH5W4 plant.

40. (Amended) A method for producing a PH5W4-derived maize plant, comprising:

- (a) crossing inbred maize line PH5W4, representative seed of said line having been deposited under ATCC Accession No. [_____] PTA-4434, with a second maize plant to yield progeny maize seed;
- (b) growing said progeny maize seed, under plant growth conditions, to yield said PH5W4-derived maize plant.

41. (Amended) A PH5W4-derived maize plant, or parts thereof, produced by the method of claim 40 [], said PH5W4-derived maize plant expressing a combination of at least two PH5W4 traits selected from the group consisting of : a relative maturity of approximately 116 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, high yield, below average scattergrain ears, above average resistance to Ear Mold, good grain texture, above average grain quality, above average early stand count, above average early growth, above average stalk lodging resistance, adapted to the Central Corn Belt, Southcentral and Southeast regions of the United States].

42. (Amended) The method of claim 40, further comprising:

- (c) crossing said PH5W4-derived maize plant with itself [or another maize plant] to yield additional PH5W4-derived progeny maize seed;

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- (d) growing said progeny maize seed of step (c) under plant growth conditions, to yield additional PH5W4-derived maize plants;
- (e) repeating the crossing and growing steps of (c) and (d) [from 0 to 5 times] to generate further PH5W4-derived maize plants.

43. (Amended) [A] The further [derived maize plant] PH5W4-derived maize plants, or parts thereof, produced by the method of claim 42.

48. (Amended) The single gene [conversion(s)] conversion maize plant of claim 47, wherein the gene is a dominant allele.

49. (Amended) The single gene [conversion(s)] conversion maize plant of claim 47, wherein the gene is a recessive allele.